Australian Government
Bureau of Meteorology

Tropical Cyclone Ingrid

4 – 10 March 2005 (Brisbane)
11 – 16 March 2005 (Darwin)

Bureau of Meteorology

A. Summary

Severe Tropical Cyclone *Ingrid* caused significant impact on the Australian coast in March 2005. It was unusual in that it is the only cyclone in recorded history to impact, as a severe tropical cyclone, on the coastline of three different States or Territories. It crossed the Queensland east coast south of Lockhart River at Category 4; moved across the Gulf into the Northern Territory and impacted on the small islands north of the Arnhem Land coast as a Category 5 cyclone; weakened slightly to Category 4 as it crossed Croker Island and the Cobourg Peninsula; was at Category 3 intensity as it traversed the Tiwi Islands north of Darwin; and finally re-intensified to Category 4, before making a final landfall on the West Australian Kimberley coast at that intensity.

Ingrid was a small cyclone in size, but very intense, not unlike Cyclone *Tracy* that devastated Darwin in 1974. For this reason, communities more than 100 km from *Ingrid*'s path (like Darwin) were affected only slightly. Also, while some significant rainfall was reported, (e.g. 445mm in 24 hours at Emma Gorge in the Kimberley) the amounts were not as remarkable as those reported after some other larger, but less intense cyclones in the past.

Large sea swells outside of Australia's warning area caused a boat to capsize near Kerema in Papua New Guinea, resulting in the loss of five lives. Despite the widespread impact area of this cyclone, and the wind strengths experienced, there have been no reports of serious injury or death in Australia. Community feedback has shown that this was largely due to the accuracy and timeliness of the Cyclone Watches and Warnings.

B. Meteorological Description

On 3 March a tropical low developed north of the Gulf of Carpentaria, then drifted eastwards into the Coral Sea. It developed into a tropical cyclone on 6 March and turned back towards the Queensland coast as it rapidly intensified, reaching Category 5 at 9am on 8 March. Over the next week, the cyclone followed a relatively straight course to the west-northwest, then west. It crossed Cape York Peninsula into the Gulf of Carpentaria on 10 March, temporarily weakening over land, but gathered strength extremely rapidly as it headed for the NE corner of the Territory. It passed just north of Nhulunbuy on the morning of 12 March, and then travelled along the north coast of the Top End and the Tiwi Islands before moving offshore into the Timor Sea. At this stage, it changed direction towards the southwest, ploughing into the Kimberley coast near Kalumburu on the evening of 15 March. It weakened as it

moved inland, finally decaying below cyclone strength on the morning of 17 March after passing Wyndham.

C. Impact

The cyclone crossed Cape York Peninsula at a remote location, however at the coastal crossing point a substantial number of trees were defoliated, stripped of bark, and felled. A 2.7m storm tide also inundated the coast 60 km south of the Lockhart River township.

Communities along the north coast of the Northern Territory were not so lucky. Widespread tree damage and moderate damage to infrastructure was reported along the Arnhem Land coast. Six ships in a local pearling fleet were sunk or damaged. There was evidence suggesting a storm surge of several metres at Drysdale Island. The school at Gawa, on the northern tip of Elcho Island, received substantial damage, and the people of the nearby Nanginyburra community were unable to return home for several months due to the number of fallen trees. Although *Ingrid* had weakened slightly, there was still widespread damage at the Minjilang community on Croker Island, with around 20% of buildings losing some or all of their roofing. The cyclone had weakened further before reaching the Tiwi Islands, so damage to buildings was limited, although vegetation, powerlines and similarly exposed structures did suffer significant damage. Darwin was spared the major wrath of the cyclone with gusty winds and rain only causing minor problems with unstable trees.

In Western Australia, the cyclone seriously damaged the remote resort of "Faraway Bay", northeast of Kalumburu. Vegetation was stripped, and several buildings were destroyed. The accompanying storm tide deposited boats about 100 metres inland and several metres above the usual high tide mark. Luckily the resort was closed for the off-season and the caretakers took shelter in a shipping container secured in concrete to withstand cyclones. At Kalumburu several houses were unroofed but in general structures withstood the cyclone. Floodwaters cut the Great Northern Highway near Kununurra and isolated some properties

D. Observations

Maximum Reported Wind Gust
207 km/h at McCluer Island, 03:40CST 13 March
174 km/h at Truscott, 03:40WST 16 March
148 km/h at Kalumburu, 01:30WST 16 March

Lowest Reported Pressure
967.4 hPa at Truscott, 04:30WST 16 March
973.6 hPa at Kalumburu, 02:40WST 16 March
974.5 hPa at McCluer Island, 03:20CST 13 March

Rainfall
192 mm at Gove Airport in the 24 hours until 9am on 12 March
438 mm at Truscott in the 24 hours until 9am on 16 March, including 341.2 mm in four hours. See rainfall distribution in Fig. 8.

Table 1. Best track summary for Tropical Cyclone *Ingrid* 4 – 16 March 2005
Note: Add 8 hours to convert to WST. Refer to best track database for complete track details.

Year	Month	Day	Hour	Latitude	Longitude	Max Wind Knots	Central Pressure hPa	Radius Gales nm
2005	3	4	0000	11.5	140.0	20	1007	
2005	3	4	0600	11.5	141.0	20	1007	
2005	3	4	1200	11.5	142.0	25	1007	
2005	3	4	1800	11.5	143.3	25	1007	
2005	3	5	0000	11.7	144.3	30	1007	
2005	3	5	0600	12.0	145.2	30	1004	
2005	3	5	1200	12.3	146.4	35	1004	60
2005	3	5	1800	12.4	148.0	35	1002	60
2005	3	6	0000	12.7	148.2	40	1000	60
2005	3	6	0300	13.0	148.2	45	990	60
2005	3	6	0600	13.4	148.4	50	985	70
2005	3	6	1200	13.6	148.7	70	975	70
2005	3	6	1800	13.8	149.0	80	965	80
2005	3	7	0000	14.1	148.7	85	960	70
2005	3	7	0600	14.3	148.6	100	945	70
2005	3	7	1200	14.3	148.4	100	945	70
2005	3	7	1800	14.0	147.9	110	940	60
2005	3	8	0000	13.8	147.4	115	935	60
2005	3	8	0600	14.0	146.9	120	930	60
2005	3	8	1200	13.9	146.5	115	935	60
2005	3	8	1800	13.6	146.1	110	940	60
2005	3	9	0000	13.6	145.6	110	940	60
2005	3	9	0600	13.4	145.1	100	945	70
2005	3	9	1200	13.3	144.5	90	960	60
2005	3	9	1500	13.3	144.0	90	960	60
2005	3	9	1600	13.3	144.0	90	960	60
2005	3	9	1800	13.2	143.8	95	955	60
2005	3	9	1900	13.2	143.7	95	955	60
2005	3	9	2000	13.3	143.5	95	953	60
2005	3	9	2100	13.3	143.4	85	965	60
2005	3	10	0000	13.2	142.8	60	975	60
2005	3	10	0600	13.2	142.3	50	985	40
2005	3	10	1200	13.0	141.5	40	990	20
2005	3	10	1800	12.7	140.1	60	978	40
2005	3	11	0000	12.5	139.4	70	970	50
2005	3	11	0300	12.5	139.0	80	961	50
2005	3	11	0600	12.3	138.7	85	956	50
2005	3	11	0900	12.2	138.2	90	951	50
2005	3	11	1200	12.1	137.8	100	944	50
2005	3	11	1500	12.0	137.3	115	937	50
2005	3	11	1800	11.9	136.8	125	924	50
2005	3	11	2100	11.8	136.3	125	924	50
2005	3	12	0000	11.6	135.9	125	924	50
2005	3	12	0300	11.6	135.3	125	924	50
2005	3	12	0600	11.5	134.9	125	924	50
2005	3	12	0900	11.5	134.4	125	924	50
2005	3	12	1200	11.4	133.9	125	924	50

2005	3	12	1500	11.3	133.3	115	934	40
2005	3	12	1800	11.2	132.9	100	948	40
2005	3	12	2100	11.2	132.5	90	948	40
2005	3	13	0000	11.2	132.1	90	950	50
2005	3	13	0300	11.3	131.7	80	956	50
2005	3	13	0600	11.3	131.3	80	956	50
2005	3	13	0900	11.4	131.1	70	963	50
2005	3	13	1200	11.4	130.8	70	964	50
2005	3	13	1500	11.4	130.5	70	966	50
2005	3	13	1800	11.5	130.3	60	971	50
2005	3	13	2100	11.6	130.0	60	971	40
2005	3	14	0000	11.5	129.7	70	966	40
2005	3	14	0300	11.6	129.6	70	964	40
2005	3	14	0600	11.8	129.4	70	964	40
2005	3	14	0900	12.0	129.1	80	954	50
2005	3	14	1200	12.0	128.7	90	946	50
2005	3	14	1500	12.1	128.4	90	946	50
2005	3	14	1800	12.1	128.3	90	946	50
2005	3	14	2100	12.5	128.3	100	942	90
2005	3	15	0000	12.8	127.9	100	942	90
2005	3	15	0300	12.9	127.7	100	940	90
2005	3	15	0600	13.2	127.5	100	940	90
2005	3	15	0900	13.5	127.4	100	940	90
2005	3	15	1200	13.8	127.1	100	940	40
2005	3	15	1500	14.0	126.8	80	956	40
2005	3	15	1800	14.1	126.6	70	963	50
2005	3	15	2100	14.1	126.5	60	969	50
2005	3	16	0000	14.3	126.4	55	973	50
2005	3	16	0300	14.4	126.5	50	978	80
2005	3	16	0600	14.5	126.8	45	980	90
2005	3	16	0900	14.8	127.1	40	982	60
2005	3	16	1200	15.0	127.4	40	983	50
2005	3	16	1500	15.1	127.8	35	987	50
2005	3	16	1800	15.2	128.1	35	988	20
2005	3	16	2100	15.3	128.4	30	991	

Figure 1. Track of Tropical Cyclone *Ingrid,* 4 – 16 March 2005. *All times in UTC.*

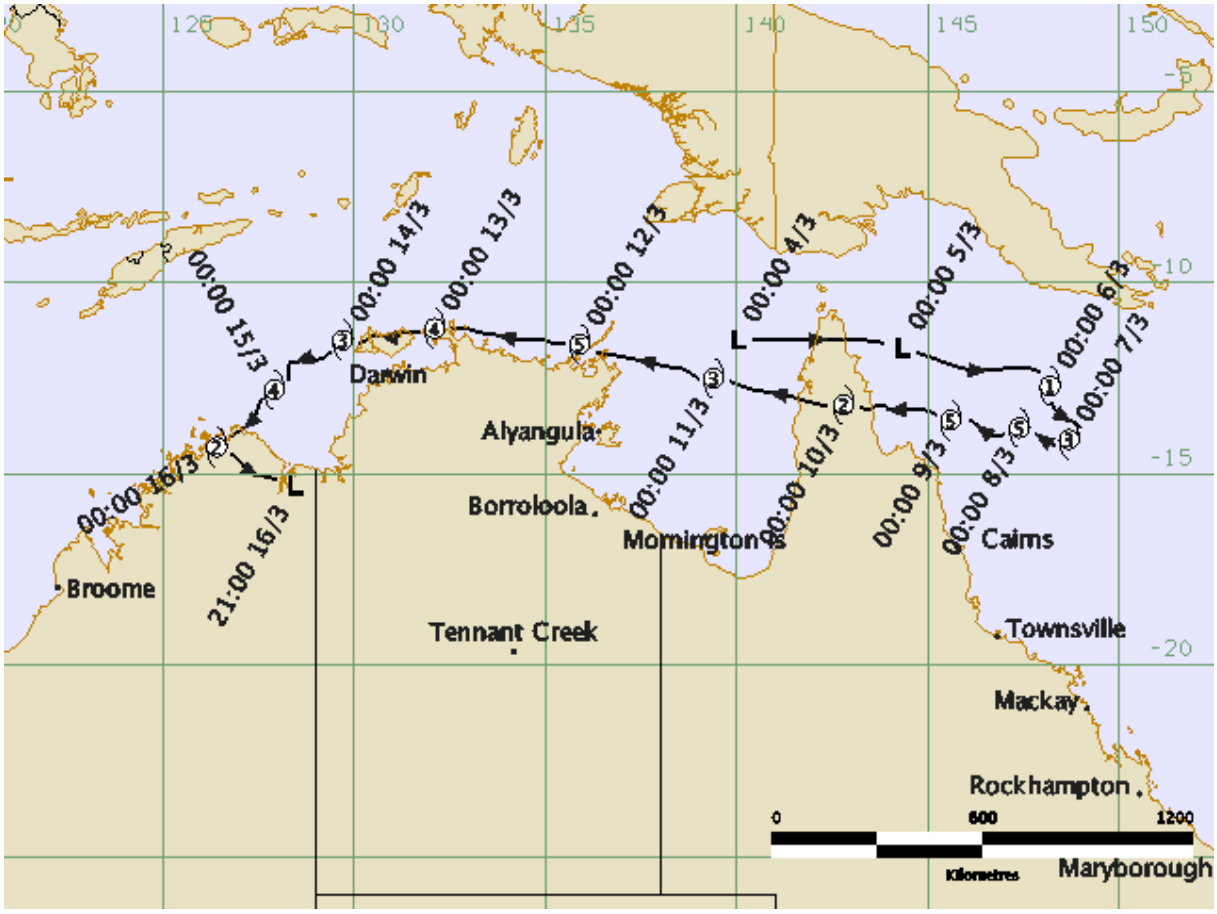

Figure 2. Visible satellite image at 0800 UTC, 8 March 2005. Image from *NOAA-12* satellite received and processed by Bureau of Meteorology courtesy of NOAA (USA).

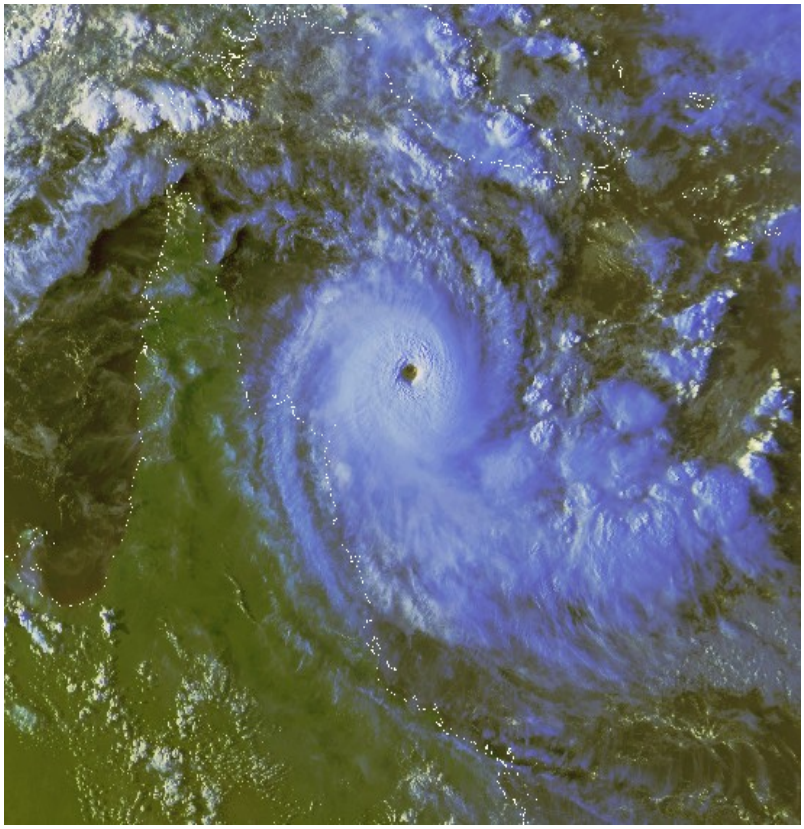

Figure 3. Visible satellite image at 0200 UTC, 15 March 2005. Image from *NOAA-17* satellite received and processed by Bureau of Meteorology courtesy of NOAA (USA).

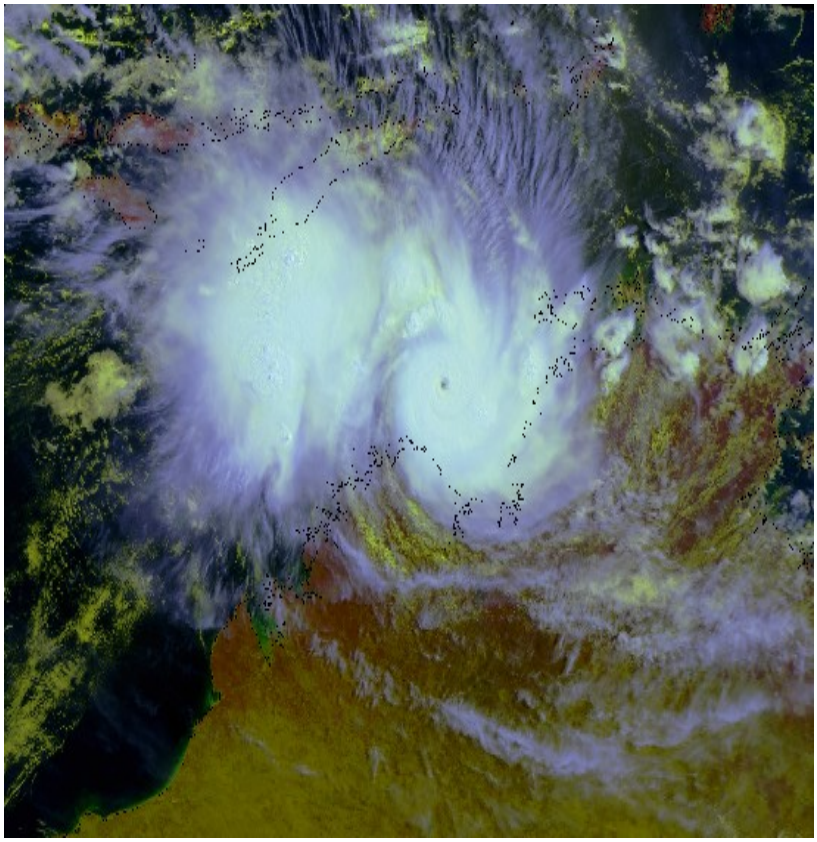

Figure 4. Weipa radar image at 2130 UTC 9 March 2005.

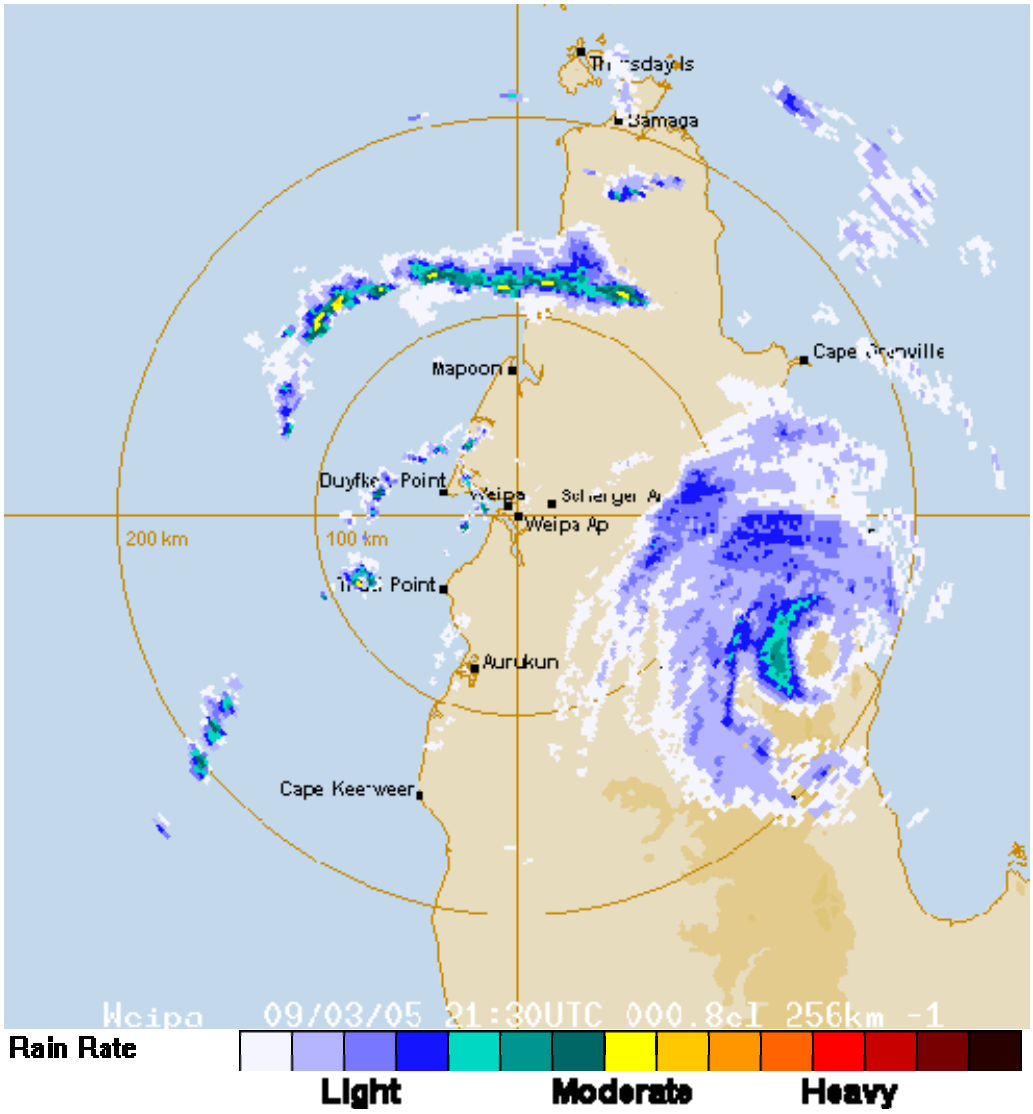

Figure 5. Gove radar image at 1500 UTC 11 March 2005.

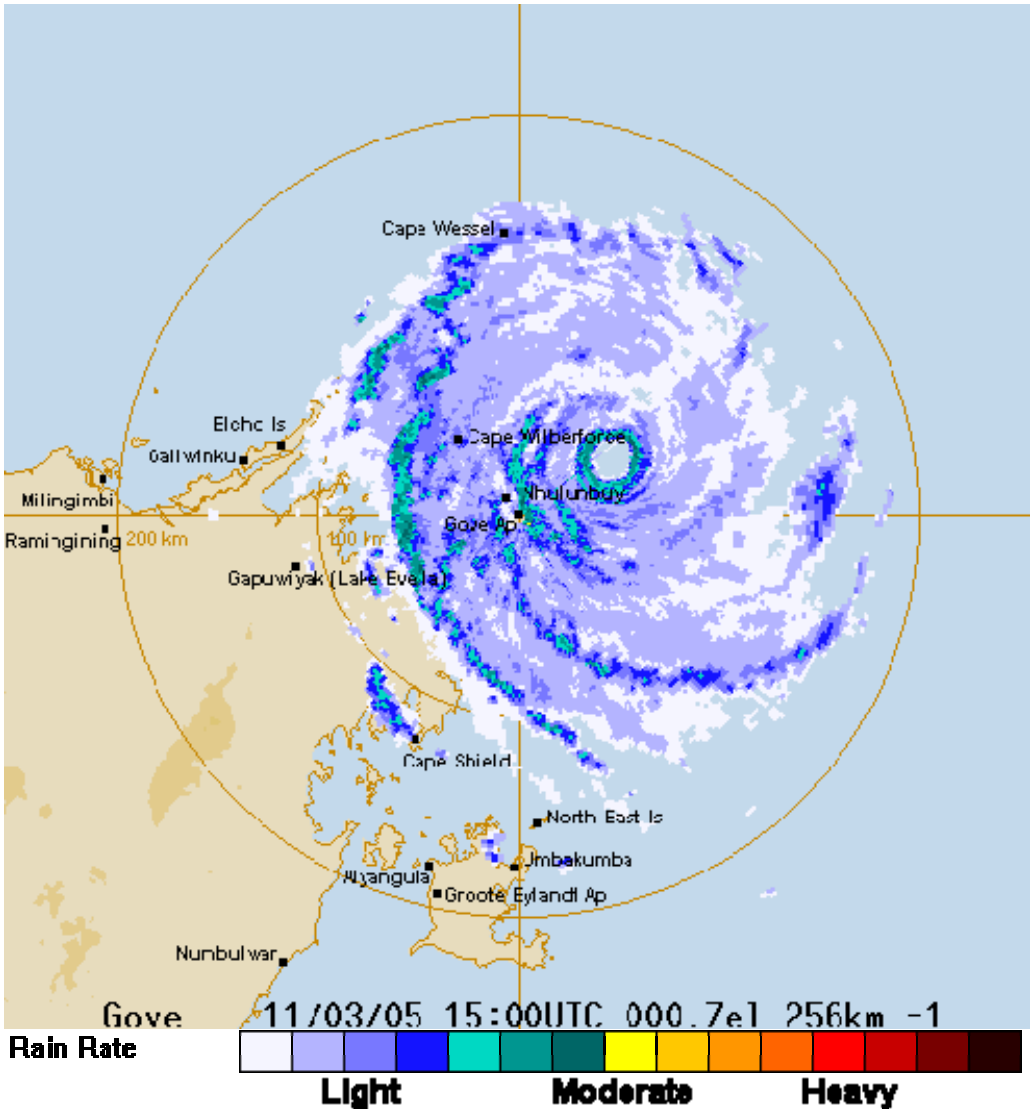

Figure 6. Darwin radar image at 0630 UTC 13 March 2005.

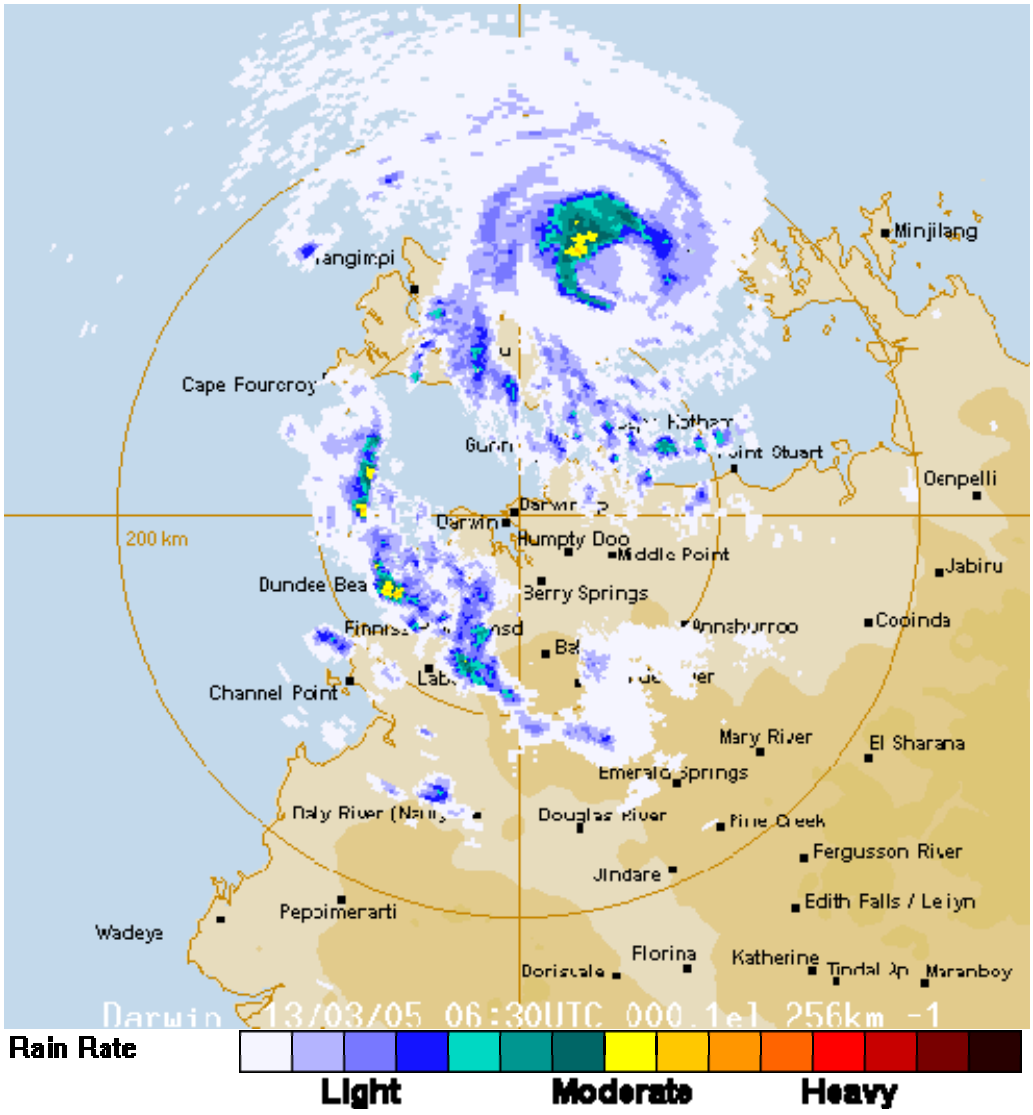

Figure 7. Wyndham radar image at 0900 UTC 15 March 2005.

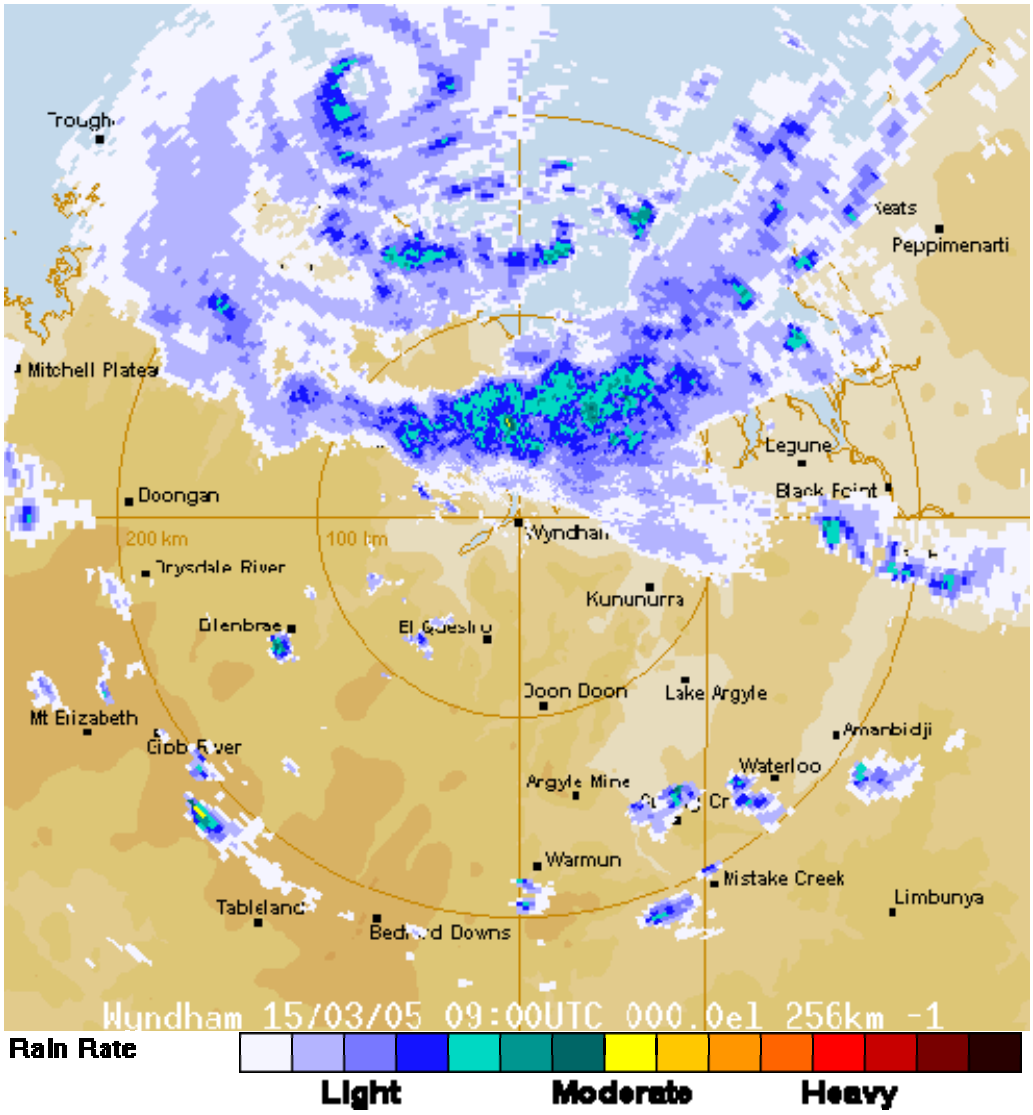

Figure 8. Rainfall distribution fro the week ending 9 am 18 March 2005.

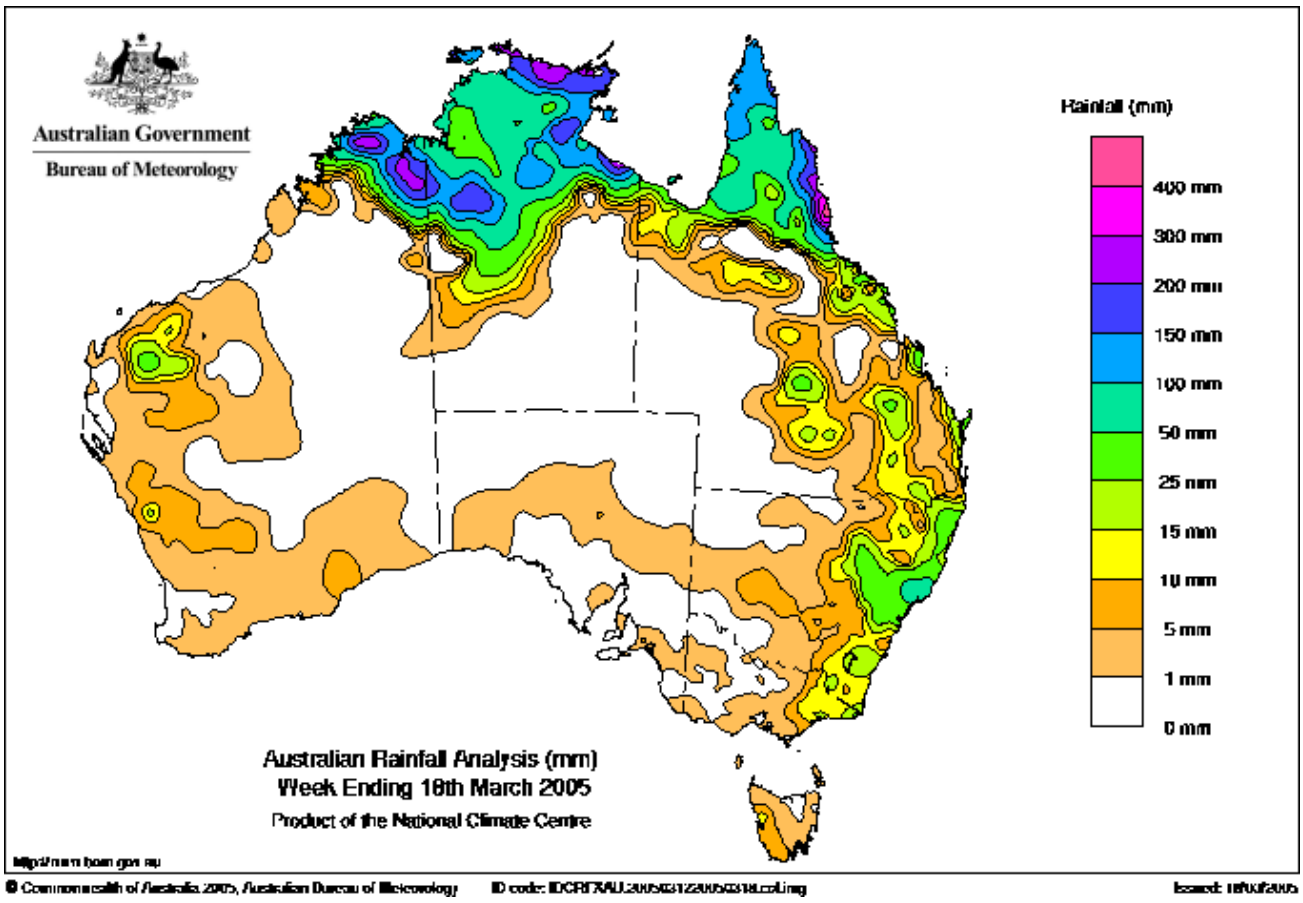

Figure 9. Impact Photos

A. 

B. 
C. 
D. 
E. 
F. 
G. 
H. 
I. 

A. The caretakers house at Faraway Bay Resort, on Western Australia's remote Kimberley coast, after *Ingrid*. Credit: Geoff Mackley.
B. The Cobourg Peninsula after Ingrid. The notable feature is that all the trees are defoliated. Credit: Bill Milne, Bureau of Meteorology.

C. The Dunham River crossing on the Great Northern Highway (in the Kimberley) in flood on March 17, 2005. Image courtesy of Main Roads Western Australia.

D. Photo taken at the area of highest storm surge and strongest winds. Trees have been pushed inland by the wind and storm surge (ocean flooding). Some of the trees have endured substantial defoliation, and many of them have a raw, pink tinge to their bark, also indicating massive wind damage. Credit: Peter Otto, Bureau of Meteorology.

E. Photo taken at Friendly Point - the southern limit of the influence of the very destructive core of TC Ingrid. Widespread and complete defoliation was evident on ridges and a very large number of trees, particularly those close to the coast and those protruding above the tree canopy. Credit: Peter Otto, Bureau of Meteorology.

F. Photo taken at the area of highest storm surge and strongest winds. If the bark of a tree is strong, bark stripping can indicate that Category 4 strength winds were experienced. Credit: Peter Otto, Bureau of Meteorology.

G. Tractor on Drysdale Island off the Arnhem Coast, in the direct path of Ingrid. There are indications that the tractor was bogged by seawater as a result of a several metre storm surge. Credit: Rebecca Patrick, Bureau of Meteorology

H. Damaged roof of a new school building at Gawa Christian School, northern end of Elcho Island off the Arnhem coast. Credit: Paul Huddleston

I. Remains of the school building at Minjilang on Croker Island. More recent structures built to the cyclone code survived much better. Credit: Bill Milne, Bureau of Meteorology